

REMARKS

The above amendatory action is taken prior to an examination of this continuation application on the merits. Claims 18-33 now on file correspond to the claims on file in the parent application after the Amendment dated January 23, 2003, with the exception that claim 18 has been amended to make clear that the grained aggregated material is mixed with the soft bituminous binder at temperatures that result in formation of a "warm mix" (see specification at page 3, first paragraph). Claim 34 further recites that the recited aggregate material consists essentially of sand, gravel and filler in accordance with the disclosure in the specification at, for example, page 1, lines 5-11, and Fig. 1 of the drawings.

In the Amendment dated January 23, 2003 in the parent application, Applicants explained that the claimed invention is based on Applicants' finding that, surprisingly, the use in combination with a soft bituminous binder of a hard bituminous binder that is foamed (rather than a bitumen power or a bitumen emulsion) can provide an asphalt composition that can be produced at lower temperatures than a hot mix with attendant advantages (see specification at page 4, lines 9-15 and Table 1 on page 8). Asphalt had previously been made by combining aggregate with a foam binder only in cold mix processes and such asphalt was not suited for wearing surfaces. There was nothing in the prior art that would show or suggest the preparation of an asphalt composition by mixing aggregate with a soft bituminous binder in combination with a hard bituminous binder that is foamed in a warm mix

process.

In the parent application, the Examiner rejected the claims under 35 USC 103(a) as allegedly being unpatentable over Hendriks et al '950 in view of Clarke et al. Applicants respectfully traverse this rejection on the basis that nothing in the cited references, taken alone or in combination, provides a motivation for combining the references to arrive at the claimed invention, and it is only through hindsight, with the aid of Applicants' specification, that one of skill in the art would have used the foamed binder described in Clarke et al in a warm process as described by Hendriks et al.

In the Official Communication of November 13, 2003, the Examiner acknowledges that Hendriks et al do not disclose the use of a foamed hard binder, but contends that Clarke et al disclose a method of preparing a **warm mix**, foamed asphalt binder. In the Official Action of March 28, 2003, the Examiner contended that Hendriks et al in view of Clarke et al discloses that "the heated foamed hard binder is formed by mixing the heated hard binder and steam in a mixing chamber such that the **foamed aggregate** can be mixed, in situ with soil or road construction materials. . ." Applicants respectfully submit, as discussed below, that Clarke et al do not teach, and in fact teach away from, the use of a foamed hard binder in a warm mix process. First, however, Applicants respectfully note that an **aggregate** cannot be **foamed** and discuss first the terminology used in the references and the claims to avoid confusion.

"Asphalt" as used in the Clarke patent, only refers to a bituminous binder. In the present specification, asphalt or asphalt mixes refer to a mixture of bituminous binder components and gravel/sand. This is a vital difference because, as discussed below, the binder material of Clarke may be heated to create a foam while the gravel and sand, or aggregates, are left cold. In other words, the fact that the binder is heated says nothing about the process in which heated binder is used. Indeed, the fact that paving grade bitumen is described in Clarke does not necessarily mean that paving grade asphalt aggregate mixtures are even produced (see Clarke et al at column 1, lines 30-31, which describes the use of this kind of bitumen for soil stabilization). It certainly does not mean that the binder is used in a warm mix process. Indeed, as next discussed, Clarke et al teach away from the use of the binder they describe a warm mix process.

Clarke et al discloses heating "asphalt" to 224-350°F for foaming purposes, but, insofar as Clarke et al contemplate that the heated asphalt will be used to coat aggregate, they contemplate that this foam will be used to coat cold aggregate material. Clarke et al clearly contemplates a cold mix process. Clarke et al emphasizes the advantages of not having to heat the aggregate material, as Clarke points out in column 3, lines 6-8, and still achieve good covering of the aggregates. The use of unheated substrate is emphasized in column 25, lines 45-46 of Clarke. Furthermore the claims (see Clarke at column 26, line 30 and 48) clearly contemplate that the foamed asphalt is applied to a substrate at ambient conditions. The Examiner has contended that Clarke et al disclose a method of coating aggregate to form a warm

mix asphalt for use in roadways. It is however respectfully not possible to find where in the Clarke patent this is taught.

Clarke et al do specify using paving grade asphalts, also known as asphalt cements or penetration grade asphalts, as pointed out in column 4, line 46-48, but not the use of an asphalt aggregate mixture for this purpose. As pointed out, for example, in the present specification at page 2, last paragraph, this kind of cold mix is unsuitable for paving applications.

In short, there is nothing in Clarke et al that would provide a motivation for one of skill in the art to use the foamed binder described therein in a warm mix process. Similarly, there is no motivation in Hendriks '950 to do so. To the contrary, Hendriks '950 teaches away from a foamed hard binder by teaching that the hard binder component is preferably added as a powder (Hendriks at column 1, lines 59-60). This described preference for the addition of a powdery hard binder to the Hendriks process is indicative of the nonobviousness of the claimed invention since the use of bitumen powder is fraught with difficulties, as next discussed.

Bitumen in powder form is not commercially available and is only produced in laboratories. The manufacture of bitumen powder requires very expensive equipment, and is subjected to a so-called powder explosion hazards during production and storage. The use of bituminous powder is normally considered as a theoretical or desktop alternative. Bituminous powder is not practically possible to handle in the

area of penetration described. The powder described by Hendriks has a penetration of less than about 10 to make it possible to stay in a powder form at ambient temperatures. The softening point according to ASTM D36 will be at around 80°C and would make it impossible to manufacture asphalt at a temperature at around 90-120°C. At this temperature, unsatisfactory coverage of the aggregate, high mass viscosity and problematic spreading conditions, such as unevenness of the covering and undesired degree of cavities in the mixture would be the result.

In view of the above, it is respectfully submitted that it could not have been obvious from Clark to use a foamed hard bitumen binder in the process of Hendriks '950. Hendriks '950 issued more than ten (10) years after the Clark patent and the use of a foamed hard bitumen binder in the Hendriks '950 process, as opposed to a bituminous powder, was still not contemplated by Hendriks et al. This would not have been the case if it had been obvious to use a foamed binder in the Hendriks et al process with even a reasonable expectation of success.

In view of the above, it is respectfully submitted that the references previously cited in the parent application do not set forth even a *prima facie* case of obviousness for the invention claimed herein. Accordingly, an early and favorable examination of this application is respectfully requested.

Respectfully submitted,

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